

The Responsible Research and Innovation Test



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What is responsible research and innovation?

It's a governance concept that aims to guide research towards societal goals. Synenergene gives this definition of Responsible Research and innovation (RRI) : « *a nascent governance concept developed in the context of the European Commission's 'Science in Society' programme. RRI means that a wide variety of social groups, stakeholders and citizens collaborate throughout all stages of research and innovation in order to better align both the processes and its outcomes, with the values, needs and expectations of society. Societal challenges like sustainable food production, ecosystem restoration, optimized biofuel production, and improvement in human health will have a far better chance of being tackled if all societal actors are fully engaged in the co-construction of innovative solutions, products and services* »¹.

Why is it important ?

We believe the iGEM projects are a great opportunity to test and spread this concept among scientists.

In order to see how iGEM teams handled this concept and how it can guide them through their research, we made a RRI test. This test aims to rethink the projects in order to see how the team handled the responsibility issue. This RRI test is divided in four parts² : reflexivity, anticipation, inclusiveness and responsiveness.

¹ <https://www.synenergene.eu/information/synenergene-approach>

² The four dimensions of RRI come from the article *Responsability and intellectual property in synthetic biology*, Harald König, Pedro Dorado-Morales, Manuel Porcar

I/ Reflexivity

The reflexivity leads the team to think about the choices that has been made, “the underlying purposes, motivation and potential impacts of the project”. The question of reflexivity happens in the first step of the project. Reflexivity tries to find how the team thought about the purpose of the innovation.

- What is the purpose of the project ? Does it meet societal goals ? (ex : ecological, humanitarian).
- How did the team defined a societal need ? Did the team meet stakeholders to define it ?
- Why do we think this project is interesting ? Why did the team chose the project ?
- How does the project address the societal needs ? What could be the concrete applications of the project ? Who will use/benefit from the applications ?
- What are the potential impacts, positive and negative ?

II/ Anticipation

Anticipation deals with “describing and analyzing possible impacts, and creating the appropriate solutions and policies”. Every scientific project includes impacts. Even though all the impacts can’t be predictable at the beginning of the project, a lot of them can be seen.

The anticipation is scientific, but can also be used to choose the right legal framework. Following the article *Responsability and intellectual property in synthetic biology* of Harald König, Pedro Dorado-Morales, Manuel Porcar, we believe iGEM is a great place for an anticipation of the right legal framework for inventions. Thinking about it can help to determine the roles of the different IP schemes on innovation and how it meets the societal goals of RRI. The questions iGEM teams needs to answer are : what would be the right legal framework according to RRI ? How the legal framework can impact the societal goals the team is aiming ?

We believe there is no perfect answer and that the legal framework in intellectual property is a “diverse ecology”, where we have to choose the most relevant framework according with the particularities and goals of the project.

- At the end of the project : did the team saw all of the potentials impacts of the project ? Did new impacts appeared ?
- How/When did they appear ?
- Did this impacts reshaped our project ? How ?
- Beyond iGEM : what is the future of the project ?
- What is the scientific future ? (can the work be reused easily ? Can the innovation of the project becoming dangerous when used by others ?)

➤ What would be the best legal framework, following responsible and societal goals ?

- Open license
- Patent
- Patent with humanitarian licensing
- Plant variety right
- Others

➤ Why ?

A few questions to help :

- what are the societal needs ?
- what would be the best legal framework for societal needs ? The choice is not obvious. For example, open access is not always the best for societal needs : without economic gain, the innovation can be stopped. Similarly, patent is not always the best choice and innovation can be impeded by a monopolization of the invention.
- do you think the choice of a legal framework will impede innovation ?

III/ Inclusiveness/deliberation

Inclusiveness and deliberation means “listening to perspectives from publics and stakeholders”. We believe that iGEM is the best place for inclusiveness and deliberation for a scientific project. Indeed the iGEM projects lead students to popularise science and discuss their project. Furthermore the pluridisciplinarity of the team leads also to inclusiveness and deliberation. The inclusiveness fostered by RRI can bring a lot to iGEM teams, when it's taken into account.

- Did the team meet publics and stakeholders ?
- Did the team use popular science to reach the general audience ?
- How did you define who were the stakeholders ? Who were they ?
- What did we learn ? Did it reshape the project ?
- Did you have the opportunity to meet/exchange with other iGEM teams about your projects ? Did you take into account their remarks ? How ?

IV/ Responsiveness

Responsiveness is a good indicator for the efficiency of RRI in the project. Searching if the previous dimensions helped to shape the project toward the RRI'goals.

- Did the previous dimensions (reflexivity/ anticipation / inclusiveness) reshaped the project ? How ?